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The Province of Alberta

IN THE MATTER OF "THE NATURAL GAS UTILITIES ACT"

—and—

IN THE MATTER OF an Enquiry into Scheme to be adopted for Gathering, Processing and Transmission of Natural Gas in Turner Valley

G. M. BLACKSTOCK, Esq., K.C., *Chairman*

Dr. E. H. BOOMER, F.C.I.C., *Commissioner*

Session:

CALGARY, Alberta November 12th, 1945.

VOLUME 51

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I N D E X

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9.30 A.M. Session,
November 12th, 1945.

THE CHAIRMAN: All right, Mr. McDonald.

MR. McDONALD: I am ready to call Mr. Zinder.

HANINA ZINDER, having been duly sworn, examined by Mr. McDonald, testified as follows:

Q Mr. Zinder, would you outline for the information of the Board your educational qualifications, and your contact with the Public Utility business?

A All right. I have a Degree of Bachelor of Science in Electrical Engineering from the Carnegie Institute of Technology. I received a Degree of Matter of Business Administration from Northwestern University, where I specialized in the field of Public Utilities. I received a Certificate of Completion from the Central Station Institute in Chicago, which was operated by the Commonwealth Edison Company of Chicago, Illinois, and I partially completed work towards a Ph.D. Degree at the University of Wisconsin.

As to my experience, briefly it has been as follows:

For approximately six years, 1924 to 1930, I was employed by the Commonwealth Edison Company of Chicago. This employment followed my graduation from Carnegie Tech in 1924. While with the Commonwealth Edison Company, I was employed in various departments of the Company, including operating experience in their generating plants. The largest portion of my employment with this Company was spent in making cost reports on comparative costs of Central Station service, and generation of electricity privately by large commercial and industrial establishments in Chicago.

I took a short leave of absence from the Commonwealth Edison Company to complete my work towards my Master's Degree from Northwestern University. During this period I was engaged by the Institute for Land Economics and Public Utilities at Northwestern University, as a Research Assistant. Among the research projects, upon which I was engaged, was that of gathering together a large part of the material for the book on Materials for the Study of Public Utility Economics, by H.B. Dorau, which was published in 1930 by MacMillan & Company. I also assisted in a study on the effect of Commission regulation on Utilities in Massachusetts.

While working at the Commonwealth Edison Company, and obtaining my Master's Degree at Northwestern University, I lectured on Public Utility subjects at Northwestern University. I continued this lecture work for several years after completing my Master's Degree at Northwestern University. I lectured in the courses of Public Utility Rates and Public Utility Operation and Management.

In 1931 I left the Commonwealth Edison Company to join the staff of the Public Service Commission of Wisconsin. While with this Commission, I had the title of Chief Rate Analyst. I handled all manner of rate problems and testified thereon before the Commission, including problems of determination of cost of service, making cost allocations, design of rates for both the usual retail and large wholesale users of electricity.

While with the Wisconsin Commission, I was called upon as a Consultant to assist in the design and determination of the original rates for the Tennessee

Valley Authority, and for the establishment of rate policies for the Electric Home and Farm Authority.

In August, 1935, I was granted a year's leave of absence from the Wisconsin Commission to join the staff of the Rural Electrification Administration in Washington. I joined the staff of the Rural Electrification Administration in August, 1935, shortly after it was organized.

Q MR. HARVIE: Is that Washington, D.C. or the State of Washington?

A Washington, D. C. During this period I was essentially responsible for the recommendation of rate policies and their implementation. I became Chief of the Rate Division of this Administration, in which capacity I continued until December, 1937, when I joined the staff of the Federal Power Commission.

I joined the staff of the Federal Power Commission with the title of Principal Engineer, in December 1937, and in February, 1938, was made Acting Chief of their Division of Rates and Statistics. Shortly thereafter I became Chief of this Division, which position I occupied continuously for almost seven years until January 1st, 1945. In this position I had responsible charge for the direction and supervision of the Commission's activities involving engineering and rates for both electric and natural gas companies. This included a review of all gas and electric rate contracts filed with the Commission, and the making of recommendations thereon to the Commission. It included the supervision of all engineering and rate phases involved in all formal gas and electric investigations of the Commission, and the recommendation of the principles and policies to be

followed by the staff in such work. This included the principles followed in practically all of the cost allocations presented by the staff of the Commission in natural gas rate cases, as well as the determination of service lives principles in respect to depreciation, rates, and related engineering and rate matters.

Commencing in June, 1938, with the passage of The Natural Gas Act, well over 50%, and perhaps as much as 70% of my time was spent on natural gas matters. Prior to this time the Federal Power Commission had no jurisdiction over natural gas companies. It became necessary, with the passage of The Natural Gas Act, for the Commission to institute from the beginning principles and policies to be followed in its administration of this Act. I participated in the determination of and the making of recommendations of many of the principles and policies subsequently adopted by the Commission in the administration of The Natural Gas Act.

On January 1st, 1945, I left the Commission to join the firm of consultants, of E. Holley Poe and Associates, as an Associate. This firm has offices in New York City, Washington and Chicago. It is principally engaged in consultation on engineering, rate and management matters, dealing with gas and oil companies, and to some extent with electric utilities. This firm has been engaged by a Committee representing the natural gas industry of the United States to prepare the industry's case for presentation to the Federal Power Commission in connection with its present general investigation of the industry. The scope of this investigation includes conservation

matters, the uses of natural gas and broad questions as to the regulation of the production, gathering and transportation and distribution of natural gas. The announced purpose of the investigation is to formulate recommendations to the Congress of the United States with respect to any necessary amendments to The Natural Gas Act, and to gather together essential information on the industry for the Congress. My own responsibilities in the firm include supervision of most of the technical evidence to be gathered, prepared and introduced on behalf of the natural gas industry Committee.

I would like to mention also that we are consultants to public as well as private agencies. I have been engaged by both the Bonneville Power Administration and the South Carolina Public Service Authority, to assist them on their rate problems.

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Q Mr. Zinder, the firm of Poe and Associates were consulted by the Produers' Committee of the Alberta Petroleum Association with respect to this Hearing?

A They were.

Q And in January and February of this year you were concerned with the preparation of a submission to be made on behalf of the Producers' Committee?

A I was.

Q That was the brief which is entitled Brief No. 1?

A That is correct. Now I made a study of the problems involved in the production of natural gas in Turner Valley with particular reference to the case which was coming up before the Natural Gas Utiltiies Board and I was particularly concerned with the problem of determining to the extent possible of what would be a fair and reasonable price for natural gas in Turner Valley. At the completion of this study I prepared certain details and schedules as well as certain statements and opinions of the principles which were incorporated in the Brief No. 1 of the Producers' Committee of the Alberta Petroleum Association which I understand has been submitted to this Board.

BRIEF NO. 1 of Producers' Committee, ALBERTA PETROLEUM ASSOCIATION isNOW MARKED EXHIBIT 126.

Q If you would read the submission, Mr. Zinder, and make reference to any comments that you have. In view of the fact that the submission was made or prepared in January and February, there might be some changes that you want to bring to the attention of the Board.

A This Brief is directed towards the problem of determining

a just and reasonable price for natural gas at the well head in the Turner Valley field.

The regulation of field prices of natural gas is a new field of government price regulation and control. It appears now for the first time in Alberta. In the United States such regulation of production and gathering was expressly exempted from the powers conferred on the Federal Power Commission in the Natural Gas Act which was passed by Congress in 1938. Nevertheless, the Federal Power Commission has interpreted the Natural Gas Act as conferring on it jurisdiction over costs of production and gathering when the same comprise part of the operations of pipeline companies transporting gas in interstate commerce. This interpretation is now before the United States Supreme Court for review and decision. Accordingly, there are no established precedents or principles which may be followed or stated as specifically applicable to this problem. In fact, the decision in this case may, for the first time, set the pattern for the future.

At that point I would like to add an additional statement. Since the drafting of this submission, the Supreme Court of the United States has handed down its decision involving the so-called Denver Cases and the Panhandle Eastern Pipeline Company, the Denver Cases being three companies involving the Colorado River Gas Company, the Colorado Inter-State Gas Company and the Colorado-Wyoming Gas Company. In those cases the question of the Commission's jurisdiction of the regulation of the cost of production and gathering was before the Court. The Commission was upheld in its regulation of these

costs for these companies. It must be recognized, however, that these cases involved natural gas companies producing a portion of their own gas directly or purchasing their gas from affiliated interests. In these cases the Commission used its original cost less depreciation formula for determining the cost of the gas produced. The Supreme Court was substantially divided in its decision and there was a strong dissenting minority opinion as many of you no doubt know. It would appear that both the Commission and the Court recognized that the Commission's application of this formula would cover only a very narrow or small segment of the natural gas production of the United States and therefore should not be used as a basis precedent for the proper basis of determining a fair price of gas throughout the United States generally. I would like to add it would appear to me that is the case. This is substantiated by a paper read by the General Counsel of the Federal Power Commission recently before the Inter-State Oil Compact Commission in which he commented upon this decision of the Court. The essence of these comments, I take it, was that such determinations were appropriate only where there were no arms length transactions in arriving at a price for the gas. Accordingly, it could still be said that there is no established precedent or principle yet generally accepted for the determination of the field prices of gas. I may say that this problem is probably one of the most discussed subjects among Commissions having jurisdiction over natural gas companies and students of regulation in the United States. Now I go back to the statement.. In view of the precedent-establishing nature of this case, it

becomes necessary to explore all other views of appraoch to the problem. If further appears desirable that the results of these explorations should be weighed in terms of the very significant place natural gas plays in the energy resources of the Province and the effect of the results on the future economic and social development of the province. The adequacy of natural gas reserves, the conservation of natural gas, and the type of service rendered the public will all be directly influenced by the prices established by the Board.

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I would like now to discuss briefly,-

NATURAL GAS AS AN ENERGY RESOURCE

Natural gas is one of the principal sources of energy which is so essential to our industrial civilization. Together with coal, oil and water power, it is the foundation stone upon which our present machine age economy rests. The presence or absence of any one of these energy resources in any locality is bound to have a significant influence on the growth of the area and its industry and commerce.

The inter-relationship of these energy resources must be recognized. Not only are they inter-related physically as in the case of gas being found in the same fields with oil, but they also compete directly in the market in many ways. Thus, any national policies or principles which are established in connection with one of these energy sources will affect the other and in turn the whole economy of the Province or Dominion. Recognition of this inter-relationship is a first step in the development of a sound policy in the public interest.

With the exception of water power, all of these energy resources are exhaustible and irreplaceable. It is not possible to replace a gas or oil field once it is depleted. Thus, there is the need not only to conserve such supplies as are now known but also to encourage the exploration and development of new fields for new supplies.

In our system of private enterprise the equilibrium of all forces affecting these energy resources is expressed largely in one factor, namely, price. It is recognized that under unchecked and unregulated private enterprise the long-range public interest may not coincide with the effect of competitive forces. Thus, given an intensive demand for oil

with a resulting high price, natural gas found in connection therewith may be flared or otherwise wasted. This situation has existed in many places in the past. It can be corrected either by regulations governing production and conservation, or by price regulations, or both. In the United States the principal, if not the only, means adopted for the correction of such situations, is conservation regulations and not price control.

In the present instance, the problem is one of fixing price. The establishment of any price in the first instance will in turn work back through the factors that normally result in the price and cause these factors to seek a point of equilibrium. Exploration and development will either be encouraged or discouraged as a result. Some coal mines will be shut down and certain coal markets taken over or in turn gas ranges and gas-fired furnaces will be replaced in homes and factories by electric ranges or oil fired boilers.

I should also like to add that the present gas fired furnaces of course might be replaced by coal fired boilers if the price of gas exceeds the competitive level.

The influence of price fixing will not only affect the economy of the area but its effects will be felt throughout the Dominion and in the United States. A low price for natural gas or oil will build up an export demand, or bring industry from the United States to Canada. Given a low enough field price natural gas can be piped many hundreds of miles and compete with other energy resources. For example, natural gas at 5¢ per Mcf in the Gulf Coast region of the United States can still be transported over 1200 miles into the heart of the coal region of West Virginia and Kentucky and

the Appalachian natural gas fields.

MR. CHAMBERS: Is that five cents at the well head ?

A Five cents at the well head.

At that point it might be interesting to draw a circle having a radius of 1200 to 1500 miles with the Turner Valley wells as the centre, to see what markets in the United States or elsewhere in Canada might be reached within the distances that gas is now transported from fields to markets in the United States. I have not actually drawn such a circle but I would not be surprised if included within such radius would be such large cities as Winnipeg, St. Paul and Minneapolis, and Seattle, Washington, and Vancouver, British Columbia, as well as a host of smaller but still fair sized cities.

Q MR. BLANCHARD: Are any of those now served by natural gas ?

A Minneapolis is served with natural gas. Seattle is not to my knowledge. I understand Winnipeg is not served with natural gas, neither is Vancouver.

Q MR. STEER: What is the radius of that circle ?

A Twelve to fifteen hundred miles. I wish to point out that I am not suggesting by this illustration that transportation of Turner Valley gas to these markets is being contemplated or probable, but it must be recognized that being within the limits of engineering and economic feasibility, it is therefore a possibility. As such Turner Valley gas is a factor in a wide market area, though indirectly. It may be noted that there is one line already projected across the mountains and others contemplated, from the mid-continent fields in the United States to the Pacific coast.

On the other hand, the State of Wisconsin

has passed a tax of 7¢ per Mcf on all natural gas that comes into the State in an effort, presumably, to prevent any natural gas coming into the State, replacing existing energy sources and disrupting existing industries.

The very direct relationship of all energy resources is undoubtedly too well recognized to labor the point. It is, however, frequently overlooked, particularly in dealing with the problem of establishing a field price of natural gas. Certainly these effects of price fixing do not appear anywhere in the return on the investment theory of pricing.

It is for this reason that there is a very substantial and growing group of students of the subject and others who are convinced that the investment approach to the pricing of gas in the field is not sound.

THE NATURAL GAS BUSINESS

The natural gas industry is certainly one of the most unusual of all classes of business and the producing segment is not only unusual but hazardous. It is probably the only industry that must constantly increase its facilities and investment to furnish the same amount of the same commodity to the same market. It is the only industry limited to one mode of transportation. Gas production differs from other types of natural resources. Whereas oil is a well-to-storage-to-market and coal is a mine-to-storage-to-market commodity, natural gas is substantially a well-to-market commodity and a backlog of storage or reserves must be in the producing formation.

The natural gas business differs in further respects from other classes of business. The merchant or manufacturer who increases his output will do so by increasing his purchase of merchancise or raw materials, but this does not affect his

ability to purchase merchandise or raw materials in subsequent years. When natural gas companies increase their output they must do so by using up a capital asset, their only stock in trade, an irreplaceable and exhaustible natural resource.

An adequate supply of gas is vital to the continued existence of every natural gas company, and conditions must be such as to make it economically feasible to build the necessary pipe line facilities from field to market. The market cannot be moved; the product cannot be transported by rail or truck, but the company must depend on transportation facilities constructed at great cost as gas can only be transported by pipe line.

Every gas well, when connected to a pipe line outlet, declines in rock pressure and deliverability day by day and year by year until its ultimate exhaustion and abandonment. Therefore, to maintain adequate supplies when the demand is fairly constant many wells must be drilled to replace the gas being utilized and compressor stations must be built to increase the deliverability from low pressure wells. New fields may be discovered but many of them are found in areas where known reserves are already plentiful rather than in areas of scarcity. The new fields may be close to existing markets or existing transportation systems, but many are far enough distant from both to require large expenditures in the construction of new pipe line facilities. The size of the total proven reserves of the Province or the Nation offers little consolation to the gas pipe line or distributing company which is connected to a failing supply and finds the gas producer unable to finance an expensive drilling campaign or the pipe line company unable to finance the construction of pipe lines

to a new field having adequate reserves. I would like to insert at that point:- thus the producer must obtain his return from his particular well or from the field that he operates, since he may not have a further opportunity once his reserves have been depleted and the pipe line company or market obtains its future supply from another producer or field. Therefore the field price must not only be adequate to care for the producer now delivering to the market, but sufficiently attractive to encourage development of additional fields.

Every time a well is drilled, every time a new well is connected to a pipe line system, and every time a well is abandoned, the expenditure of substantial sums of money is required. When new fields are connected the required expenditures are substantially greater, especially since the pipe in old lines usually cannot be removed until the new lines are constructed, and old lines are never removed until the wells to which they are connected have declined in pressure to the point of abandonment.

The average gas company must constantly and continually make substantial expenditures in searching for new supplies of gas, rearranging its existing pipe line systems, building additional compressing station capacity and constructing additional pipe lines to new sources of supply.

NATURAL GAS - A COMMODITY

One distinguishing characteristic of regulated public utilities is that they render a service and it is the service which is regulated both as to price and conditions. The railroad, electric, telephone and water utilities all have this characteristic. The gas utility has also been considered as having this characteristic. Such classification arose, however,

principally with respect to manufactured gas companies and then almost wholly with respect to the local distribution of gas to ultimate consumers within an urban area.

The production of natural gas is distinctly different from the common utility characteristics of local distribution or even the production of electricity and manufactured gas.

I might add there in my opinion the production of natural gas can be said to be more that of a mining industry rather than a service industry.

Q Mr. Harvie: More of a what ?

A Mining. In the nature of a mining industry.

Furthermore, there is the added difference that natural gas is a commodity. Thus: principles applicable to pricing of service industries do not necessarily apply to the production of natural gas. This is true even though the pricing of natural gas at the well is only one step in the process of determining the domestic consumer's burner-tip rate.

When used in the home or in commercial establishments it is the heating qualities of natural gas which are used. In recent years there has been a growing recognition of the possible use of the hydrocarbons present in natural gas. The war has intensified research in this field and actually advanced the use of natural gas for many purposes. This represents the use of natural gas as a commodity -- a use which will compete in ever-increasing volumes with the heating uses of natural gas.

The most important chemical or non-fuel use of natural gas from the point of view of the volume of gas is the manufacture of carbon black. The original channel process for

manufacturing carbon black has long been recognized as an inefficient use of natural gas. The more recent furnace process results in five times as much carbon black per unit of gas. Thus, while the carbon black industry heretofore required very low price natural gas, the value of natural gas for the manufacturer of carbon black has increased. This change in process may well change the general conception of use of natural gas for carbon black from being almost a waste of gas to its being a superior use.

Natural gas is also a source of hydrogen for the manufacture of ammonia. The war has required a vast increase in the production of ammonia from which to produce nitric acid for explosives.

Natural gas is an important source for the production of aviation gasoline. The manufacture of aviation gasoline uses hydrogen derived from natural gas, isobutane derived from natural gas, and isobutane produced from normal butanes which are extracted from natural gas.

Most recently there is being developed means for the production of motor fuel from natural gas. Much attention is being given to the Fischer-Tropsch process. This process is now beyond the engineering stage. A large plant having a daily capacity of 5,000 barrels is now approaching the construction stage in the United States. This plant will ultimately require 150 million cubic feet of gas daily. It is planned for an ultimate capacity of 15,000 barrels a day.

It is recognized that the products of the chemical industry will vitally affect the future of all industry. Natural gas as a source of hydro-carbons, an important factor in most of these developments, can expect to enjoy an ever-

increasing market as a commodity. It will have a definite and probably increasing value as such a commodity which will compete with the present value of natural gas which is used principally as a fuel.

There are many producers in the United States who are hesitating at this time to make long term contracts for their natural gas since they believe that higher prices will develop in the future, and are holding their gas for such time. Such long term contracts as are being made invariably provide for increased prices during the latter years of the contract.

COST VERSUS VALUE

The traditional utility approach to the price problem is one of determining costs including an allowance for profit. Where adequate records are available, past costs should be susceptible of ready determination. In the utility industry these costs may be projected into the immediate future and the supply and demand predicted with some degree of assurance.

In the production of natural gas also past costs may be ascertained. Undoubtedly these costs will differ in the case of each individual producer. Even if it were considered feasible to make such determinations for each individual producer it does not follow that such costs are a proper price. Price is an estimate of future costs under future supply and demand conditions. Who can determine with mathematical accuracy how much geological, geophysical, geochemical, and other exploratory work will be necessary to locate a new area; how many dry holes must be drilled to discover the new reserve; what the land-owners in an area may demand as bonus and rental for their leases and, finally, how much gas will be found in

the new reservoir? Under such conditions past costs are almost no more than of historic interest as far as establishing price is concerned. This approach has been termed "roundabout" and an attempt to fit the industry to the books it keeps, rather than to follow principles in conformity with the economy of the industry.

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However, in view of the fact that the Natural Gas Utilities Act by its terms provides that the well installation is a public utility, it may be of interest to consider a calculation of the cost of gas per M.C.F. arrived at by applying in an approximate way ordinary utility return ininvestment principles to the well investment and cost of gas, without giving to the gas any value as a commodity, either in place or when produced at the well head.

At this point I would like to add that such a calculation is set out in Schedule 1-A which is a revision of Schedule 1, as contained in the original submission.

MR. McDONALD: Mr. Chairman, I have prepared a copy of the revision of schedules and I will distribute them.

THE CHAIRMAN: These three pages will simply be substituted for the three pages which follow page 13.

MR. McDONALD: Yes, which follow page 13 .

MR. CHAMBERS: There are six pages there.

MR. McDONALD: Yes, those six pages which follow page 13.

THE CHAIRMAN: Yes. Are there any alterations in the figures in Schedule 1?

MR. McDONALD: Schedule 1 we are withdrawing. We are not going to use Schedule 1. What we have done, Mr. Chairman, is to use the material obtained by Mr. Hamilton subsequent to our own calculations, and we are using his without question rather than attempting to provide and introduce evidence to provide a new basis of calculation for ourselves.

THE CHAIRMAN: So that these 1, 2, 3, 4 pages are

substituted for.....

mr. McDONALD: Schedule 1 of the original submission.

THE CHAIRMAN: For the six pages following page 13?

MR. McDONALD: That is right,

WITNESS: At the time of the preparation of Schedule 1 there was not available the investment and the operating costs as determined by Mr. Hamilton, and shown in Exhibit 124, part 9. Accordingly, it was necessary to make certain estimates, that is, originally, and to attempt to obtain certain figures from Royalite directly.

Q MR. McDONALD: Will you just go a little slower, as it is quite involved, you have got it rehearsed but the other parties will require a little more time.

A Since this calculation is not submitted as an actual determination for purposes of recommending a specific wellhead price, but rather as illustrative of the result that might be obtained from a cost approach, Mr. Hamilton's figures are accepted without question. They are accepted without question for the purposes of this calculation. The calculation is based upon the 60 wholly owned gas cap wells of Royalite Oil Company Limited, which were selected by Mr. Hamilton in his statement Part 9. I will take up the discussion of this and other calculations shortly.

In the absence of a cost yardstick it becomes necessary to place a value directly on natural gas at the well head. I would like to insert at this point, as I stated previously there is a growing conviction on the part of many dealing with the problem of the price of natural gas at the well, that such gas has an intrinsic value.

For example, in a recent hearing before the Federal Power Commission in connection with its general investigation of the natural gas industry, its docket number G-580, which was held at Kansas City on September 18th, the Honourable Richard B. McEntire, Chairman of the Kansas Commission, testified to the fact that in his opinion and in the opinion of the Kansas Commission, the price of natural gas at the well should be based not upon any cost theories and usual regulatory principles, but rather upon the intrinsic value of the gas. I mention this testimony which was given subsequent to this submission, as it is substantially in accordance with the principles which have been outlined in this submission.

Since this is the position of a State Commission which has both regulatory and conservation jurisdiction over a substantial portion of the total natural gas reserves of the United States, it is my opinion that it carries more than ordinary weight. In fact Mr. McEntire credits a great deal of the past wasteful useof natural gas to the fact that it previouslyhad not been properly valued and the prices offered and paid for such gas in the field were too low to warrant it being conserved.

When I speak of intrinsic value, I mean the value of the gas in relation to its use to society, which in turn is measured in terms of its use as a fuel in relation to other fuels and in terms of its use as a commodity. There are other factors which lead many to consider natural gas as a superior fuel in many respects which adds to the value of natural gas over and above its comparative value on a strictly fuel basis.

Under competitive conditions in most natural gas fields such a market value of natural gas

exists. Recognition of the existence of a market value of natural gas at the well head in the United States dates back to at least 1922. In this year the Bureau of Mines first began publishing such values in its annual Mineral Year Book. Publication of such data, which in some respects is equivalent to the posting of field prices, has no doubt had a stabilizing effect on field prices throughout the United States.

The market value of natural gas at the well head is recognized in many ways and is useful for many purposes. In some states severance taxes are based upon market values of natural gas at the well. Likewise, royalty payments are frequently based on market values.

For example, I would like to add there, that I understand that in Saskatchewan royalty calculations are based on 10 cents per M.C.F. field price, and a 5% rate for the purposes of royalties.

In a recent case before the Corporation Commission of Oklahom , Cause CD No. 914, Order No. 17359, In the matter of the Application of Cabot Carbon Company for Permission to Build a Carbon Black Plant in Texas County for the U.S.Government, that Commission found that:

"10. That from the evidence introduced in this cause it appears that no gas should be used in the manufacture of carbon black at a price less than the going price of gas in said field.

11. That the going price of gas in the Hugoton field in Texas County, Oklahoma, is at this time not less than five cents per M.C.F."

The Commission proceeded to condition

its order granting the application on the price of gas being not less than 5 cents per M.C.F.

If this approach to the problem is adopted in the case of natural gas, it becomes necessary to find the market value of natural gas in the Turner Valley field. Unfortunately, the conditions in this field have not permitted the establishment of such a price in the past. There has not been in the past a free market either as to supply or demand.

I would like to insert that with respect to the future, the passage of the Natural Gas Utilities Act has materially altered the situation. I do not wish to presume to interpret this Act. However, in approaching the problem of the value of natural gas in the Turner Valley field, it is necessary to consider the relationship of the producer to the market, which relationship is prescribed in a large measure, if not totally, in the Natural Gas Utilities Act. Accordingly, I am attempting to describe this relationship as it appears to me under the Act without attempting to interpret the Act. As I understand it from reading The Natural Gas Utilities Act, one of the main purposes for the enactment of the Natural Gas Utilities Act was to provide for the apportioning to every producer in the Turner Valley field an equitable share of the gas market available for gas produced in Turner Valley. However, as above mentioned, under the provisions of the Act, in making available to every producer an equitable share of the market, each gas well has been declared a public utility, and there is the apparent implication that each well has the same obligation to the public as the pipe line or gas distribution system.

In the case of unregulated gas production, the producer may determine the market he wishes to serve at a contracted price, but under the Act it is now mandatory that he first serve the public utility market prescribed for him at a price established for him, at a price established for him, after a hearing, by the Natural Gas Utilities Board. He is subject to regulation at the will of the Board and must maintain the production of gas from his wells if so directed by the Board. In other words, the equitable share of the gas reserves which the producer owns in the field, are pledged to public utility service for so long as the Board wills or the consuming public wants the gas. He relinquishes his right of open and free marketing of his gas, a right of increasing value and importance with every increase in the commodity value of gas arising from new scientific developments. The fact that the producer is placed in this position makes his gas worth more at the well because his obligation to maintain production is greater, and his freedom of action is restricted.

I would like to add that exclusive contracts for the purchase of gas from known reserves have always been known to carry a higher price than the open contract where the reserves are not dedicated to the particular sale.

In the past the experience has been that there is definitely a tendency for the market price of natural gas to reach a common level over wide areas. Accordingly, a study of the trend of the market price of natural gas in the United States may well be indicative of the relative market value of gas in Alberta and in the Turner Valley field. Indirectly, natural gas in the Turner Valley field is

in competition with natural gas produced in the United States, and as the commodity use of natural gas increases, such competition will become more direct.

Attached to this brief are a series of Schedules and Charts on the subject of the value of gas at the wells in the United States. (Schedules "2", Chart "a", Schedules "3" and "4"). It is not proposed that any of these values be adopted for the Turner Valley field. It is sibmitted, however, that the values shown by these Schedules are indicative of, and establish relative limits for, the just and reasonable price of natural gas at the well in the Turner Valley Field.

In addition, complementary to the data on the wellhead price, there is presented in Schedule "5", and Charts "B", "C" and "D", attached hereto, data comparing the cost of gas in Calgary at present prices with cost in the United States Cities of 50,000 population and over.

At this point I would like to add that since the preparation of Schedule "5" and Charts "B", "C" and "D" based on the standard measurement of the gas to the ultimate consumer in Calgary, which differs from the measurement of the gas sold to the distributing company, it has been determined that the B.T.U. content per cubic foot of the gas is approximately 1000 rather than the 1085 used in the study. To reflect this change, I have revised Schedule "5"and Charts "B", "C" and "D" accordingly. These revisions I will refer to in dealing specifically with this Schedule and these Charts.

There is also presented in Schedules "6" and "7" attached hereto, a comparison of the relative cost per B.T.U. of gas, oil, coal and electricity, when

used by the consumer in Calgary.

At this point I would like to add that these Schedules "6" and "7" are being withdrawn from this submission at this time in view of the fact that subsequent to their preparation a more detailed and comprehensive determination of the relative cost of gas and coal particularly was prepared and filed on behalf of the Producers' Committee by the firm of Denton & Spencer of Calgary . These comparisons have been made on a common basis as to heating value and efficiency of the gas sold and alternative fuels used.

I would like to make some general comments at this point as to the purpose of the original submission of these Schedules which are now being superseded by a more detailed exhibit. It is generally recognized that the upper limit of any price is the value of the service or commodity. Thus, the value of the naturalgas to the ultimate consumer determines the maximum amount that can be made available for distribution between the various parties contributing to the service rendered, including the distribution utility which absorbs the largest portion of the total cost of rendering the service. In turn, the maximum value of service is determined in a large measure by the cost of alternative substitutes for the service, which in the case of natural gas are principally coal and oil.

I would like to say further that the value of the service should not be considered as being a single point but it is rather a series of points which form the demand side of the equation of supply and demand. Thus, a series of prices are possible, all of which equal the demand at a given point. For example, it is conceivable that increasing a price

might reduce profits whereas lowering a price might increase profits. In fact, this has been the experience of many industries and businesses. It is not to be implied, therefore, that the submission of this particular comparison is for the purpose of recommending that rates be increased to the point of equilibrium with the cost of alternative substitutes.

(Go to page 3968).

At this point my part in the preparation of the submission is concluded. The conclusions which have been set up from the bottom of page 11 and on page 12 were added by Mr. McDonald and I do not believe that it is my place to comment upon them or advocate them as my own.

MR. HARVIE: Will it be read into the record?

THE CHAIRMAN: I suppose it is a matter of argument which Mr. McDonald can put in at a later date.

MR. McDONALD: Yes, it was added to include the particular things this Committee had at that time.

MR. CHAMBERS: It is really not evidence.

MR. McDONALD: No.

MR. STEER: When are we going to get the proposals of the Producers' Committee which are referred to on page 12? I am very much interested in that. If it is the intention of the Producers' Committee at some stage to place before the Board its definite recommendations as to the price to be fixed at the well head I am anxious to know when we are going to get them.

MR. McDONALD: We are going to get them when we get the information from the Gas Company which will give us enough information to make them available.

MR. STEER: I would like to have those proposals for the purposes of questioning Mr. Zinder.

MR. McDONALD: As we go further into Mr. Zinder's exhibits, we will get a fair idea of what is his opinion, as to what his own opinions are, but as to making a definite recommendation without this information we just cannot do it.

THE CHAIRMAN: Your recommendations, Mr. McDonald, will be conclusions which you say your Committee will draw from

the evidence given by Mr. Zinder and Denton and Spencer.

MR. McDONALD: Yes.

THE CHAIRMAN: The evidence given by Mr. Zinder, and Denton and Spencer and the evidence which you may obtain from the Gas Company if the Appellate Division will let you.

MR. McDONALD: That is correct.

It may be, before Mr. Zinder leaves the box, we may be able to give you some indication of what we think the limits are but to make a definite limitation now, we cannot do that without this information.

Q MR. McDONALD: You have Exhibit 1-A?

A Yes, Exhibit 1-A is headed Illustrative Computation of Cost of Production, Based on 1943 Costs and 1945 Estimated Market.

The calculation in the following Schedule "1-A" has been prepared for the purpose of illustrating the approximate application of ordinary utility investment principles to the problem of ascertaining the cost of gas per M.C.F. produced in Turner Valley.

In order to overcome the effect of the wide variance of investment in, amount of production from and operating cost of individual wells, it was thought advisable to use as a basis for the calculation a group of 60 wholly owned Gas Cap wells of the Royalite Oil Company Limited.

MR. CHAMBERS: By the way, if I may interrupt, I understand it is 60-odd, I do not know how many odd.

MR. McDONALD: Mr. Chairman, I might say that these are just selected, I counted them once and there were 60, I might have made an error in my counting but they are 60-odd or in the neighbourhood of 60 wells. They are, in any event, what wells we used at that time.

This approach was adopted by Mr. Hamilton in Section IX of his Exhibit #124, and is the same approach which was adopted in this submission. The wells included by Mr. Hamilton are the same as those which have been taken for this submission and were the basis of the original Schedule "1" submitted.

Item No. 1 shown on Schedule "1A" is the rate base adopted for this calculation. The amount shown is $2,256,820.00, which is the amount arrived at by Mr. Hamilton in his Exhibit #124, page 53.

Q Mr. McDONALD: That is in part 2 of Mr. Hamilton's?

A In part 2 of his Exhibit 124.

It should be recognized that this is a fully depreciated investment. The original investment as determined by Mr. Hamilton was in excess of $6,300,000.00. In other words, the rate base is original cost less accrued depreciation. It does not include, however, the customary items of allowances for working capital, and materials and supplies.

Nor does the $6,300,000.00 figure include allowances for construction overhead. It is my understanding that Mr. Hamilton testified to that effect.

The Second Item on Schedule "1A" is the revenue deductions.

Q MR. HARVIE: Excuse me, when you say "it should be recognized that this is a fully depreciated investment.", you mean as of this date?

A As of December 31st, 1943.

Q And on the basis adopted by Mr. Hamilton?

A That is correct.

The Second Item on Schedule "1A" is the revenue deductions. These deductions are as determined by Mr. Hamilton in his Exhibit #124. These revenue deductions are operating expenses and retirement cost. The retirement cost as determined by Mr. Hamilton is on a unit depletion basis and includes not only depletion, but depreciation and amortization. The total of these two items amounts to $97,297.00. In Mr. Hamilton's direct testimony he indicated that the operating expenses of $47,019.00 represented his own determination based upon allocations which he had made of joint expenses of the Royalite Company. This amount is accepted for the purposes of this calculation.

The Third Item of residual credits again are the amounts determined by Mr. Hamilton in his Exhibit #124. The items include credits for crude oil and gasoline sales. The total of these credits amounts to $35,508.00, which less royalites, is $31,070.00.

The specific reference to Mr. Hamilton's exhibit will be found on the calculation sheet, Mr. Chairman.

The deduction of these credits from the revenue deductions leaves a balance of $66,227.00 as representing the cost of gas before royalties, income tax and return. This amount is shown on Schedule "1A" as Item No. 4.

For the purposes of this illustration a rate of return of 8% has been assumed. This assumption is arbitrary and represents an approximate mid-point between the ranges of the rates of return which have been used in various Exhibits submitted to this Board, which have varied from a low of 6% used in Mr. Hamilton's Exhibit #124, to a high of 9½% used in Exhibits introduced by Mr. Hamilton,

Madison and British American. The amount allowed for return is shown as Item No. 5 and is $180,546.00 a year. This amount is approximately 5¢ per M.C.F.

Item No. 6 is the income tax allowance which is estimated at $96,555.00. This estimate is based upon the present 40% income tax rate and making allowance for the depletion credit provided for tax purposes.

Item No. 7 represents the Royalties which have been computed at a rate of 12½%, being an average taking the Government Royalty at 15% and Royalty to freehold owners at from 5% to 10%. The amount of Royalties is $49,104.

The total cost which represents the total revenue that should be received from the sale of gas from these wells using utility regulatory principles is thus $392,432.00. The 1945 estimated market deliveries from these wells is 3,510,439 M.C.F. This calculation therefore would indicate a necessary well head price of 11.2¢ per M.C.F. for the year 1945. It should be recognized that these total costs will not vary substantially with either an increase or decrease in the annual deliveries. This was particularly illustrated by Mr. Hamilton's Schedules as part of his Part IX Exhibit #124, and it is further obvious from a review of the costs as set out in this Schedule "1A". Thus, this average price will be increased materially with a reduction in deliveries, and will decrease as deliveries increase.

Q MR. McDONALD: And dealing with this particular computation, Mr. Zinder, did you make a computation of the earnings with, using a fixed price, I suggested to you, you used 5¢ as a fixed price.

A I have done so, Mr. McDonald.

I have worked this same problem backwards to find what rate of return would be earned on these same wells if a price of 5¢ per M.C.F. were established as the value or price of gas at the well head. The total revenue for the 3,510,439 M.C.F. would be $175,522.00. The revenue deduction would be the same as it is shown in Schedule "1A" or $66,227.00. The royalty would differ and would be $21,940.00, based on the 5¢ gas. The income tax would change and would be $39,666.00 or a total of those three items, the revenue, royalties and income tax would be $127,833.00.

Deducting this total from the revenue of $175,522.00 reduces the balance available for return of $47,689.00. This amount is approximately 2.11% on the rate base of $2,256,820.00.

And you might look at it another way and assuming the same 8% return, the amount available for return represents 8% on a rate base of $596,112.00.

Q Now in connection with this approach to your problem, Mr. Zinder, have you given any consideration to the problem of ascertaining a price of gas produced by crude oil wells on this same investment basis that you have referred to in your illustration?

A Yes. I have.

I have not made any actual computations of such costs that I would recommend with respect to crude oil wells, since it appears to me that any such computations require some arbitrary assumption or leads around in a circle.

Before outlining the considerations which led me to this conclusion I want to point out that I am not recommending that the price of gas at the well be established

at cost even if it could be determined with more certainty than appears possible and administered, but at value. Cost is a factor in determining value but the cost that must be considered in such determination is that applicable to the production of natural gas from the Gas Cap wells and not where it is a minor or incidental by-product. This is particularly true since over the estimated life of this field the largest portion of the gas going to market will come from the Gas Cap wells and not from the crude oil wells.

All wells are joint gas and oil wells. In the calculation just made for Gas Cap wells no attempt was made to determine the cost of crude oil which is incidentally produced. The cost of gas was determined by crediting the sales of crude oil at its market value against the total costs. This is customary practice where joint products are involved in a single production process. It must be recognized that the cost of the incidental product is not determined in the process. This procedure is only valid in the determination of the cost of the principal product. Furthermore it is not a true cost determination, but simply a business convenience since the value set for the incidental product may or may not be equal to its cost if such cost could be found.

The same method could be applied in determining the cost of oil in a crude oil well where gas is an incidental product. Mr. Hamilton, in his Exhibit #124, WH-57, followed this procedure. However, in crediting the gas sales from these wells he did so by assuming a value of the gas at 2¢ per M.C.F. This was an entirely arbitrary assumption for purposes of his calculations. Thus, his

calculation does not arrive at or indicate any amount for the cost of gas, but rather is a beginning toward the calculation of the cost of oil. His cost of oil, so determined, is therefore either high or low depending upon whether his assumed value of gas is below or above the actual value of the gas.

If, on the other hand, the principle is adopted that the cost to be assigned to a crude oil well is that amount which, when added to the sales of crude oil at existing market price, covers total cost; thiswould be an indirect regulation or establishment of a price for crude oil.

(Go to page 3976)

The price or cost of gas would go up or down inversely with the price of crude oil and there would have to be some designation of the amount of earnings a crude oil well was entitled to earn on its oil sales. Furthermore, some odd results could occur which are apparent from reference to statements WH -57 of Mr. Hamilton's Exhibit No. 124. Before any return on the investment is included this statement would indicate a cost of gas, under the procedure just outlined, from a possible negative figure to as much as $1.00 per Mcf. Royalite well #40 would require a price of gas of $1.00 per Mcf to make up the deficit shown for 1943, before return , of $12,518.51.

Another approach to the problem would be to attempt to allocate the total costs to the products produced. Cost allocations are frequently made in the case of utility industries. Such allocations deal, however, with a single product, kilowatt hours of electricity, cubic feet of gas, gallons of water, etc., and not with different products. Where joint products are produced it is generally recognized that it is practically impossible to determine a true cost. However, since gas and oil are both essentially fuels and since the B.T.U. content of each of the common denominator as to their fuel use I have made an allocation on such basis. This calculation is perhaps novel but is cited here as being of possible interest.

MR. McDONALD: Just a moment, Mr. Zinder. I have made copies of the calculation and will distribute them.

SHEET ENTITLED "ALLOCATION OF COSTS ON A B.T.U. BASIS" NOW MARKED EXHIBIT 127.

A The basis of my calculation is again Mr. Hamilton's Exhibit

No. 124, Statement WH-57. This statement shows the total expenses in 1943 plus royalties for the wholly owned crude wells of Royalite as $832,870.00. Sales of crude oil were reported as 659,631 barrels. The gas produced by these wells was reported as 2,405,134 Mcf. The oil contained an estimated 4,155,675 million B.T.U. and the gas 2,609,570 million B.T.U. on the basis of 6,300,000 B.T.U. per barrel and 1,085 B.T.U. per Mcf.

MR. McDONALD: I might make an explanation there. You obtain that 659,631 barrels by adding the 1943 of specific wells as reported by the Conservation Board and filed with the Board in Exhibits ?

A That is correct.

Q And similarly for the gas figure that follows ?

A Similarly for the total gas produced by these wells. The gas produced by these wells was reported as 2,405,134 Mcf.

Q MR. STEER: Where does that$832,870.00 come from ?

A Yes, taking WH-57 total expenses are shown.

MR. McDONALD: Just a moment, Mr. Zinder.

A Total expenses are shown as $708,782.00. That is at the bottom of column 8.

Q MR. STEER: Then you add the royalties ?

A To that I have added the royalties. Mr. Hamilton deals with royalties as a deduction from revenue. I have added it as an expense item. The oil, that is the 659,631 barrels contained an estimated 4,155,675 million B.T.U., and the gas 2,609,570 million B.T.U. These amounts were arrived at using 6,300,000 B.T.U. per barrel of oil.

MR. HARVIE: What is that figure ?

A 6,300,000 B.T.U. per barrel of oil and 1,085 B.T.U. per Mcf.

The total B.T.U. produced was therefore 6,765,245 million B.T.U., resulting in an average cost of 12.31 cents per million B.T.U. This is 13.36 cents per Mcf.as the cost of gas before rate of return and $0.84 per barrel of oil. Again it would be before rate of return or any return. No attempt has been made to refine the calculations on this approach to the problem to account for natural gasoline. It is submitted, however, that if a cost approach is to be used in connection with crude oil wells then the method which I have described in my opinion deserves some consideration.

The total Mcf. of gas produced was not marketed. Only 891,850 Mcf. was marketed. The cost allocated to gas in the example above is $321,238.00 which when laid against the low amount marketed results in an average cost of 36.02 cents per Mcf. If this same calculation is made but using the gas marketed as a base in lieu of the gas produced for allocation purposes an average cost of 17.64 cents per Mcf. of gas marketed is obtained. Again that cost being before including any amount for return.

I would like now to go to Schedule No. 2 in the statement.

SCHEDULE NO. 2.

This schedule, together with the accompanying Chart No. "A" shows the marketed production of natural gas and the average value at the well in the United States each year for the period 1920 to 1943,inclusive. The data are taken from published reports of the United States Bureau of Mines.

The value figures published in the Bureau of Mines reports are not precisely synonomous with price. Each year the Bureau sends out questionnaires to producers asking for the amount of gas produced and the value of the gas at the

well. The questionnaire is phrased in terms of value rather than price, since some producers utilize their own gas in the manufacture of carbon black or for other purposes. In such cases no price exists and a value is estimated by the producer based upon well-head sales in the same field or in the area. For all practical purposes, however, this value is widely accepted and used as an index of price.

Between 1920 and 1940 the average value of gas at the well has shown a gradual and almost consistent decline year by year from 11 cents to 4.5 cents per Mcf. Since 1940 the average has shown an increase each year to 5.3 cents per Mcf in 1943. Except for the depression years of 1930 to 1934 the volume of gas produced for the market has shown an almost yearly increase from almost 800,000 million cubic feet to 3,415,000 million cubic feet.

Probably the most important single factor contributing to the decline in average value at the well has been the decreasing influence of the Appalachian area in the total gas production of the United States. The value of this gas, which is almost all dry gas from shallow wells and produced close to the large industrial and populated eastern cities, has always been much higher than the production in the Mid-continent or Gulf-coast regions. The production and average value of gas in the Appalachian area is shown in Schedule No. "4" and the accompanying chart.

It is significant that notwithstanding a substantial increase in production between 1940 and 1943, the average value has increased. It would appear that the bottom was reached in 1940. The increased market for natural gas has largely eliminated distressed prices. Recently one large

pipe line company made long term contracts for the purchase of gas at 5 cents per Mcf for the initial period of the contract, and higher thereafter, in the Gulf-coast region. This was above the prevailing well head prices in the area. In justification of its action the Company frankly stated that it was done so as to buy as much gas as possible or in other words, to assure an ample supply of gas for the project. The Company not only considered this good business but also an aid to conservation.

As will be shown in later schedules, outside of the Appalachian area, there is a tendency for the market value of natural gas to reach a common level in all fields, whether in the Mid-continent or in the Gulf-coast area, of about 5 cents per Mcf at this ti e. The conditions of production vary widely in these areas but the value of gas at the well stays within comparatively narrow limits. This tendency is reflected in the United States average which has not varied more than 1 cent per Mcf in the eight-year period, 1936 to 1943, inclusive.

MR. McDONALD: Have you any explanation of the charts that follow ?

A I do not think so Mr. McDonald other than the analysis which I have just made and which I think covered the essential points as to the trend in the average value at the well.

THE CHAIRMAN: And I think we will leave Schedule #3 for a ten or fifteen minute adjournment.

(At which time the Hearing was adjourned for a short period.)

MR. McDONALD: Schedule #3 Mr. Chairman, the prices for the year 1944 now become available and I have revised the

schedule to include both 1943 and 1944 instead of the year 1943 which is in the submission.

THE CHAIRMAN: That will be one additional page then.

MR. McDONALD: It is marked 3-A so I can either file that as an Exhibit -

THE CHAIRMAN: It will simply be an additional page to Exhibit 127.

A Since preparation of this submission, it has been possible to obtain more recent figures with respect to the field prices for natural gas paid by the selected pipe line companies in the United States. There has been little change in these prices between 1943 and 1944. However, for the purpose of bringing this material up to date I have revised Schedule #3 which is now designated Schedule #3-A, to show both 1943 and 1944 data. I think you may find that the 1943 figures on Schedule #3-A differ from the same figures on Schedule #3. The correct figures are on Schedule #3-A and the change represents a correction of Schedule #3. This Schedule shows the average cost per Mcf of natural gas purchased by nine major pipe line companies for 1943 and 1944.

MR. CHAMBERS: Is that at the well head ?

A At the well head. Essentially at the well head. They are called field prices and essentially at the well head.

Q MR. STEER: What do you mean, essentially ? What is it essentially ?

A Some of these pipe line companies purchase from a large number of producers in the various fields. Some is purchased at the well head and some may be purchased at the end of the gathering line and some may be purchased at the outlet of the gasoline plant, but most of them - they are all deliveries in the

field and they are called field prices with a large portion of it being well head deliveries.

Q Now what you say is that a large portion of the gas that is delivered in accordance with this Schedule 3-A is gas that is purchased at the well head ?

A Yes, I would say a substantial portion.

The data for this schedule were obtained from the annual reports filed by these companies with the Federal Power Commission. The nine companies have been divided into three groups of three companies each in accordance with the principal source of the natural gas supply. No particular basis was used for the selection of these companies other than the availability of the data from public reports as to prices paid by large pipe line companies in the mid-continent and Gulf-coast field. It is believed that the prices paid by these companies represent the market value of gas in these fields when purchased in large quantities.

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In the Panhandle and Hugoton fields the average cost of purchased gas for the three companies - Northern Natural, Panhandle Eastern and Natural Gas Pipeline Company - varied from approximately 4 to 5 cents. These companies purchase all or a substantial portion of their total requirements. Most of the contracts covering these purchases were made some years ago. Recently, the Oklahoma Commission found that the going rate for gas in the Hugoton field was "Not less than 5 cents per MCF". The principal markets to which gas is delivered by these pipeline companies are:

Northern Natural . . . . . Minneapolis, Minn.
Panhandle Eastern . . . . . Detroit, Mich.
Natural Gas Pipeline Co. . . Chicago, Ill.

Q MR. HARVIE: Those are all long hauls are they?

A Yes, they are, 800 to 1200 miles.

The Monroe (Louisiana) field is now recognized as being definitely on the decline. It hasbeen the source of natural gas for a number of major pipe line companies. The three pipe line companies - Mississippi River Fuel Corporation, Interstate Natural Gas Company, Inc., and Southern Natural Gas Company - obtain their supply of gas principally from this field. Mississippi River Fuel purchases its entire requirements, whereas Interstate both produces and purchases in the Monroe field. Southern Natural does not produce any gas in the Monroe field but obtains approximately 75% of its total requirements by purchase from this field.

The wide range of prices of gas in the Monroe field, averaging 4.64 cents for Interstate to 7.28

cents per MCF for Mississippi River is partially due to field prices determined by the Federal Power Commission, some of which are now in litigation. The going price for gas in this field for pipeline customers has been 7 cents to 8 cents per MCF. This is evident from the average price paid by Mississippi River in 1943 of 7.28 cents per MCF. The lower averages shown by Interstate and Southern Natural are the result of investigations by the Federal Power Commission. As a result of these investigations theFederal Power Commission has established or accepted as reasonable field prices varying from 4.16 cents per MCF to 6.75 cents per MCF. The case involving the price of 4.16 cents per M F is now in litigation.

I might say or add at that point that is a case that is a case that involves the Interstate Natural Gas Company.

Q MR. HARVIE: There is just one point, Mr. Zinder, "This is evident from the average price paid by Mississippi River in 1943 of 7.26 cents", should not that be 7.28 cents?

MR. McDONALD: Yes, that is a correction that should be made. 7.26 should be 7.28.

THE CHAIRMAN: Mr. Zinder read it as 7.28.

THE WITNESS: I read it as 7.28, but I should have called attention that it represented a change in the submission.

Q MR. STEER: You said something about the litigation, Mr. Zinder, what litigation is that?

A It involved the Interstate Natural Gas Company. That price and the authority of the Commission to regulate and determine that price is being litigated by the Interstate Natural Gas Company. The case is in the Circuit Court of Appeals, as I understand it.

Q THE CHAIRMAN: Does that too arise out of the proper construction of the Natural Gas Act?

A That is correct.

The Monroe field is a small scale sample of what can happen in the regulation of field prices by an attempt to apply the usual utility formulae. The confusion that would normally follow establishment of such a wide spread of prices in a single field has been minimized by the fact that this field is controlled largely by relatively few producers and the field is rapidly approaching depletion. Even so, representatives of the industry have approached the Federal Power Commission informally asking that the Commission, if it could do so, establish a uniform field price. This matter has not been pressed by the companies. However, apparently because the fundamental question of whether the Commission has authority to fix any field prices for natural gas is now before the Supreme Court of the United States for determination.

The principal markets to which gas is delivered by these companies are:

Mississippi River Fuel . . . . . St. Louis, Mo.
Interstate Natural . . . . . New Orleans, La.
Southern Natural . . . . . Atlanta, Ga.

The systems of the Cities Service Gas Company, Lone Star Gas Company, and United Gas Pipeline Company differ in one major respect, physically, from those of the six companies so far mentioned. The systems of these three companies each cover a very wide territory whereas the systems of the other six companies consist principally of a single large pipeline going to a major market. As a result, these

three companies purchase gas from numerous gas fields which are in proximity to their lines. Gas is purchased both in the field at the wells and at the outlet of gasoline plants.

Cities Service and Lone Star produce gas in many of the fields from which they purchase gas. United Gas produced no gas but it purchases a substantial part of its total requirements from an affiliate, Union Gas Producing Company.

There is a correction at that point, the word "gas" should be struck. It is the Union Producing Company.

Many of United's purchases from Union Producing Company are made in fields where gas is purchased from other producers as well. Cities Service Gas Company likewise purchases some of its gas from its affiliated oil company.

The area covered by these three systems stretches from the Gulf-Coast region up to the Panhandle and Hugoton fields. United, the largest purchaser, has the lowest average cost per MCF of gas purchased of 3.97 cents, whereas Lone Star has the highest average cost of 5.57 cents per MCF. Thus, over this very wide area covering hundreds of gas fields, the market value of gas will average 5 cents per MCF.

I would like to go to Schedule No. 4, which is the average value of gas at wells, West Virginia, Kentucky and Pennsylvania, for 1922 to 1943.

West Virginia, Kentucky and Pennsylvania are the principal natural producing gas states in what is generally termed the Appalachian area. The marketed production

and average value at the well of natural gas for each of these States for each year from 1922 to 1943, inclusive, is shown in Schedule No. 4.

The Appalachian area production is probably the least comparable to the production in the Turner Valley field of any area in the United States. Production is substantially all dry gas from shallow wells with comparatively low production per well. The data as shown here for the purposes of indicating the influence of these prices on the United States averages and the effect on value of proximity to market. Those comparatively high values of natural gas at the well in this area, are also interesting in view of the fact that is one of the principal coal producing regions in the United States. These high values of natural gas, however, have practically eliminated its use for boiler fuel in the gereration of electricity or in large industrial establishments. Natural gas in this area is principally used for distribution to ultimate consumers.

Taking Schedule No. 4 it will be seen that in Pennsylvania for 1943 the average value at the well is 23 cents. This is the highest of any of the three States shown. The highest average value in Pennsylvania is 29.3 cents for the year 1928. In West Virginia, which is probably the furthest from the principal market served in the Appalachian area, the price in 1943, or average value at the well rather, was 12.3 cents. In Kentucky it was 14.7 cents for 1943. I would say that the principal markets in the Appalachian area or for Appalachian area gas, is Pittsburgh and Cleveland, a good deal of Ohio, and that gas is also carried into New York State.

Q MR. CHAMBERS: Mr. Zinder, could you give us any idea

of what the names of the companies are, the main ones in those areas, offhand?

A Yes. The big companies are the East Ohio Gas Company, the Hope Natural Gas Company, the People's Natural Gas Company, the Manufacturers Light & Heat Company, the Equitable Gas Company, the New York State Natural Gas Company. Those are the principal pipeline companies and some of those companies also distribute gas. Oh, yes, several others, is the Ohio Fuel Gas Company, the United Fuel Gas Company. The Eastern market or the Appalachian area is in a larve measure divided between two systems. That is, between two systems as we speak of them. One is the Columbia system, which covers a large part of Ohio and down into West Virginia, and the other is the Consolidated Natural Gas Company's system, that is, the Hope Natural Gas Company, People's Natural Gas Company, the East Ohio Gas Company and the New York State Natural Gas Company.

The unit of measure of heating value used in the following Schedules is the Therm, which by definition represents 100,000 British Thermal Units.

A British Thermal Unit (B.T.U.) is a unit of measure commonly used in the gas industry to denote the heating value of the gas. Gas is usually sold at a stated price per cubic foot, each cubic foot containing specified heating values expressed in B.T.U. per cubic foot. Thus, for cooking, for example, fewer cubic feet of gas having 1,000 B.T.U. are required than would be the case with gas having, say, 750 B.T.U. Consequently, from the standpoint of heating value, gas having 1,000 B.T.U. per cubic foot, is cheaper than gas having 750 B.T.U. per cubic foot, when offered at the same price per cubic foot.

In order, therefore, that rates for gases having varying heating values per cubic foot, may be reduced to a common denominator, the prices for heating value (B.T.U.) are used, rather than the prices for volume (cubic feet). The B.T.U.being too small a unit for practical use, a therm, having 100,000 B.T.U. is employed. Some Cities use therm rates. For the other Cities conversions were made to a therm basis. This was accomplished by dividing the number of therms in the typical bill (multiplied by 100,000) by the heating value of the gas (B.T.U. per cubic foot) as reported by the utility. The number of cubic feet thus obtained from such computation was then used in computing the typical bills by multiplying that number by the price per cubic foot.

The determination of a reasonable price of gas in the Turner Valley field is one step in a chain of price and costs determinations leading to the establishing of a price of gas to the domestic consumer in Calgary. Accordingly, one approach to the field price problem is the value of the service to the ultimate consumer. The value of the service usually is the upper limit of any price for a product or commodity.

Value of service is fixed by the cost of alternative substitutes. In the case of gas, coal, oil and electricity are competitive and alternative substitutes for various uses. Schedule No. "6" presents such a comparative analysis.

At this point I would like to say, as stated previously, that the Schedule is being withdrawn at this time to be substituted by more detailed study. Another aproach or indicator of value is a comparison of the prices

paid in various localities for similar service. Schedule No. 5 attached shows such a comparison in the form of typical gas bills of the prices in Calgary and U.S. cities. The comparison is shown for 25, 100 and 250 therms per month, and the data charted in Charts Nos. "B", "C" and "D" respectively.

I would like to say at this point that, as stated previously, Schedule No. 5 and Charts "B", "C" and "D" have been revised since the preparation of this submission to reflect the 1000 B.T.U. for Calgary rather than 1085.

At this point perhaps it would be well to point out the changes which this change makes. In Schedule 5 the bill for Calgary for 100 therms per month will be $3.00 instead of $2.77 as shown. The bill for Calgary for 250 therms per month will be $6.75 instead of $6.18 as shown. There will be no change in the Calgary bill for 25 therms per month. The amount shown is $1.00, which is the minimum bill. There will be no change in Chart "B" and the appropriate figures which I have just stated should also be reflected in Charts "C" and "D". In other words, on Chart "C", the bill for Calgary will be $3.00 instead of $2.77, and on Chart "D" the bill for Calgary willbe $6.75 instead of $6.18.

The data for the United States cities are taken from a study published by the Federal Power Commission dated March 1, 1941. It is generally conceded that there have been relatively few changes in retail gas rates since that date.

A monthly consumption of 25 therms is a comparatively small use of natural gas. In Calgary this amount of gas is included in the minimum monthly bill. Even so there are only four cities in the United States of 50,000 population or more being served with natural gas which have a lower bill than Calgary for 25 therms per month. For 100 therms per month there are also only four cities in the United States of 50,000 population and more whose bills are lower than in Calgary. For 250 therms per month, which is more nearly typical of the average use in Calgary for a six or seven-roomed house, including house heating, there are only three cities in the United States having a lower bill and those cities are Huntington, West Virginia; Amarillo, Texas and Charleston, West Virginia.

Out of the 87 cities in the United States of 50,000 population or more that are served with natural gas, only three have rates that can be considered as low as those in Calgary. These are Huntington, West Virginia, Charleston, West Virginia, and Amarillo, Texas. Huntington and Charleston are in the heart of the Appalachian gas producing area and Amarillo is in the heart of one of the largest natural gas fields in the world. Yet, the value of gas at the well in the Appalachian area in West Virginia has already been shown to be approximately 12 cents per MCF and the value of gas in the Penhandle field is approximately 5 cents per MCF. Many other U.S. cities located adjacent to and in the vicinity of large natural gas fields have much higher rates than Calgary. For example, the bill for 250 therms in Wichita, Kansas, is over 50% greater than in Calgary.

Q That is, Mr. Zinder, your submission as prepared and filed?

A That is correct. I think that concludes my direct submission with regard to this Submission No. 1.

Q Now it is not my intention to deal with a great deal of the many problems that arise in connection with field operations but there was one problem I asked you to give consideration to and that was the matter of repressuring. You are familiar with the fact that there will be a considerable amount of gas repressured in this field?

A I am.

Q Now have you given consideration to the matter of allocating costs of compressing gas for repressuring purposes?

A I have. The common and well-recognized method of costs allocation with respect to public utility properties, particularly electric and gas, is the demand and volumetric method of allocation. This method consists of dividing the costs into two categories, demand and volumetric. Into the demand category are placed those costs which are essentially proportional to the peak load placed upon the equipment, which in this case would be compressor or the equipment involved. In the second category of costs, that is volumetric costs, there are placed those costs which are largely proportional to the output or volume for ordinary purposes. Included in the demand costs are the return on the investment, income tax and depreciation on the investment in the equipment. In the volumetric costs are included all operating expenses. Other refined calculations and some of the fixed charges might reasonably be considered as being proportional to volume and some of the operating expenses are recognized as being largely fixed in proportion to the size of the

equipment or the demand thereon. For example, there is some depreciation that might be said to be proportional to volume of sales and the balance proportionate to the time factor. Certain operating expenses are fixed depending upon the size of the stations and do not vary with volume. Division might be made in costs in accordance with fixed charges proportionate to the demand and operating expenses proportional to volume. I have seen many refinements of cost allocations where there was a third category set up, namely customer costs. Or they sometimes might be simply miscellaneous costs. Customer costs might include costs of servicing customers on a per customer basis. However the major division of costs, where the major costs will be found will be in the two categories, demand and volumetric. Demand costs in total are just allocated in proportion to the responsibility of each of the uses at the time of peak load and the equipment. In the case of allocating compression costs, repressuring, as I view it, indicates that the full capacity of the equipment at the time of peak loads is required for the market. And in such conditions, then, none of the fixed charges would be allocated to repressuring. Volumetric costs would be allocated between these various services to the market and repressuring on a straight per MCF basis. I might add that this basis of costs allocation is that which was used by the Commission staff under my direction almost without any exception. There were some refinements made with respect to allocating the returns under the Federal Income Tax as between the demand and volumetric but the general principle of dividing the costs into the two main categories and allocating the demand cost in proportion to the peak load on the equipment is what I have reference to.

MR. McDONALD: Now, Mr. Chairman, subject to what might appear in cross-examination, this is Mr. Zinder's examination-in-chief.

THE CHAIRMAN: Have you gentlemen any particular desires in the way in which you will cross-examine Mr. Zinder?

MR. CHAMBERS: Mr. Chairman, for reasons that I explained to you privately, I will not be here tomorrow. The extent of my cross-examination may depend to a certain degree on what is covered by Mr. Fenerty and Mr. Steer and I would like the indulgence of the Board and other Counsel to let me go last.

MR. STEER: And between Mr. Fenerty and myself we had agreed that Mr. Fenerty should go first.

MR. FENERTY: Well, quite frankly my only regret is I wasted the week-end going over some material that has been withdrawn. I am in a position perhaps to go with some cross-examination. That may fill in some of the time but certainly I could not think of completing it. I have to get the transcript dealing with the new matter to go into that but if the Board wants me to make a start, for what it is worth I will do so.

THE CHAIRMAN: We have still a whole hour this morning.

MR. FENERTY: All right. I can usefully employ it now with something else. I will make a start anyway.

CROSS-EXAMINATION OF THE SAME WITNESS BY MR. FENERTY.

Q Mr. Zinder, I was interested when you were giving us your qualifications in the statement that you had been associated with the Wisconsin Commission. I think you said till 1934 and you said from what time?

A Not till 1934. Pardon me, it was in August 1935. 1935, I believe, I left the Commission on a leave of absence.

Q And you were there in 1933?

A I was.

Q I take it you are familiar with this submission of the Public Service Commission of Wisconsin on depreciation, published in October, 1933.

A I know that one was published.

Q Did you have something to do with this one that was published by the staff of the Public Service Commission of Wisconsin?

A That was prepared largely by the accounting staff. I cannot say that I had a great deal to do with this.

Q I was just interested in one feature of that and I wonder if their submission coincides with your view dealing with the method of arriving at depreciation.

MR. CHAMBERS: On what page?

MR. FENERTY: Page 45.

MR. STEER: The Wisconsin Public Utility Commission?

MR. FENERTY: October the 11th, 1933, published by the staff of the Public Service Commission of Wisconsin. I assume there was a certain amount of unanimity amongst the officials and advisors to that Commission on general principles.

A I think you can say that was generally so although, Mr. Fenerty, as you know, on the question of depreciation it is hard to get two people to agree entirely.

Q Well at all events the Public Service Commission of Wisconsin apparently suggested this: "Original cost, disregarding its legal status, is, in our opinion, the logical and administratively sound basis for accruing depreciation." Is that in accordance with your idea?

A If you will repeat that statement again. I would like to have the reporter read it back.

Q Perhaps it might be easier if you take it and look at these statements. I thought perhaps you had . . . . .

A Under normal circumstances I would say that that is correct. What I mean is where the books are set up on the basis of original cost, then it is original cost which you are depreciating and you would not apply depreciation under those circumstances to any other figure.

Q And would you agree with this statement: "The consumer of today pays the cost of service to him and not the expense incurred in serving a later generation."

A That is a question of policy, is it not, Mr. Fenerty?

Q I was wondering when I asked you about this, I was wondering whether you were the author of this.

A No, I am not.

Q You were just around there at the time?

A It has been a long time since I have read this over and I may add that I was more than just around there at the time.

Q You were very much in evidence around those offices at that time were you not?

A That is right.

Q And would it be fair to say you were consulted about that brief?

A No, I was not. I contributed in discussions on it.
Mr. Fenerty, the statement reads: "The consumer of today pays the cost of service to him and not the expense incurred in serving a later generation, and with actual cost as a base, accounting at least approximates fact and is not converted into a system of weird guesswork." That seems to be a

statement of conclusion. I do not know what the facts are that they are based upon. I can see the consumer today pays the cost of service now.

Q Would you say this was a proper approach to the problem, seeing that you are an accomplice, as to the way it should be done.

MR. CHAMBERS: Do you know if he is an accomplice?

A If you want my opinion, I would say generally speaking that ought to be right but I can see circumstances where it might be otherwise.

MR. FENERTY:

Q That would be a sound principle to go on, that is fair I take it?

A Yes.

Q Now at the bottom of page 2 of this Exhibit 127, you make the following statement: "That, given an intensive demand for oil with a resulting high price, natural gas found in connection therewith may be flared or otherwise wasted. This situation has existed in many places in the past." Is that your understanding of a situation which had in fact existed in Turner Valley?

A As I have read the record and understand the situation in Turner Valley, considerable gas was flared in the past and conservation measures have been instituted to relieve that situation.

Q And your enquiries, I take it, have led you to believe that gas was flared because it was produced as an incident of either crude oil or natural gasoline operations; perhaps both?

A That is right.

Q You do not have that problem in a natural gas field as such,

do you?

A No.

Q You just produce the gas as you want it?

A That is right.

Q And the cheapest place to store it is in the ground?

A That is right.

Q And when you say that it is flared or otherwise wasted, I suggest to you that that word "wasted" is not an appropriate word. I suggest to you that if that was produced in the course of oil or gasoline operations and it served a useful purpose as a gas lift in an oil well and thereafter in taking out all the contents, those that were afterwards separated in the Absorption Plant with a resulting production of natural gasoline, that they had served a useful and valuable purpose before being flared, do you agree with that?

A I agree, Mr. Fenerty, that the gas might have performed some use prior to its being flared, but I do not or cannot agree that after that use is performed and it is being flared and not used, is not a waste so far as society is concerned. That gas has a lot of value in terms of the heat content of the gas and therefore has considerable possible additional usefulness that is wasted.

Q You feel that as a natural resource, I take it, that it should not be wasted in any sense?

A That is correct.

Q And would it follow from that that unless use can be found for it, the production of oil should cease?

A I would not say that.

Q I am trying to find out where this brings us to. Would you think perhaps it is just a mistake to say it is wasted

if it is a necessary element in the production of oil?

A I did not get that last part of the question.

Q I say, let us take it this way, you say it is wasted because it is not used.

A That is right.

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Q Except in the production of oil ?

A That is right.

Q And it should not be wasted and you cannot produce the oil without wasting so you have that position ?

A Well then whether you produce the oil or not -

Q Let me follow that. Is not your logical conclusion you should not produce the oil ?

A Not necessarily Mr. Fenerty. You might instead of flaring the gas you might do as is being done here, repressure or put it back. You might find other uses for it. That,is other ways to save gas.

Q You have the alternative of not producing oil or repressuring.

A That is correct.

Q We eliminate this wastage because we agree it should not be wasted ?

A You have a third alternative Mr. Fenerty. Perhaps if I might add that is to find a market for it.

Q Yes, you enlarge your market ?

A Enlarge your market.

Q And you normally enlarge your market by reducing prices don't you ?

A Not necessarily.

Q That is the normal trend. You have told us that I think ?

A You are thinking in terms of existing markets. I am thinking in terms of finding new markets, expanding markets rather than intensifying existing markets.

Q And the normal trend is that you reduce your market price?

A In existing markets.

Q But is that not a normal trend ?

A Can I explain what is bothering me, what I have in mind ?

Q First of all tell me whether or not that is a normal trend. If you say no we will go on to something else and if you say yes, I want to know whether it is a normal trend.

MR. McDONALD: Just a moment -

Q MR. FENERTY: If he knows he will tell me.

A Well in an existing market - Let us put it this way. You can increase, Mr. Fenerty, normally increase the market by reducing prices.

Q And I think you said in one place in your report perhaps to result in larger profits ?

A Yes.

Q Well what explanation now if you have one to make.

A The point I have in mind is this. If you have gas that is being flared in the field you may to have to go longer distances in order to reach new markets then that is not a question of price in that new market. You may be able to charge double what you are charging somewhere else and still got the market.

Q Well I got ahead of myself there but it seemed to come up at the moment. I want to get back to the production of this gas. We have as you say three things that can be done. We assume for the moment that you will permit the oil industry to continue. I want you to assume that, that it is going to be allowed to continue in the Turner Valley field. Then assuming that flaring is out, that is a waste - an economic waste - then you have two things, you repressure or find another market and you have agreed with me that normally a reduction in price will give you a greater market and an increase in price will curtail a market that is a normal general proposition subject to

variation by reason of local conditions. Is that fair ?

A All right.

Q Now disregarding your increase in market. You have a repressuring proposition. That is the only alternative left ?

A You want me to assume that.

Q Disregarding increasing your market the only thing you have got left is repressuring ?

A That is correct.

Q And this problem of repressuring is not an incident of a dry gas field. It has not anything to do with it. You do not produce it ?

A No that is correct.

Q And the only reason you have a repressuring problem is because you are going to have your oil industry to continue is it not ?

A That is correct.

Q And I take it that you would not suggest that a householder should pay more for his gas in order to permit the oil industry to continue would you ?

A Mr. Fenerty I do not know how to answer that question. It might be that a householder ought to pay more.

Q I will put it another way. That repressuring gas is purely and simply an incident in the oil production ?

A It is an incident of the oil production, that is correct.

Q Is that fair and if that is so it should be a proper charge to the oil industry should it not ?

A Well, what, the cost of repressuring ?

Q Yes.

A Now you are getting into the question it seems to me of policy more than -

Q You would not suggest charging it to the householder would you ?

A The cost of repressuring ?

Q Which is an incident of the oil industry.

A If the householder is going to benefit also by this repressuring, Mr. Fenerty, then the question is there are a number of benefits resulting from the repressuring of gas. Assuming now with me, if I might continue, assume now that the oil industry or the oil well owner which would just as soon flare the gas as not since he is making his profits from oil and is satisfied but the consumer says I do not want that waste and the gas consumer says I will look here for my gas for the present and for many years to come and I want you to put that into the ground. Well then it is the gas consumer who is benefited by it.

Q And assuming that the oil operator flares his gas whenever he cannot get on the line and has been doing it for years and some of them are still doing it. Assuming those things, what would you say it was an incident of ?

A What would I say was what ?

Q I want to put it to you then, I want you to assume, and I think the evidence justifies it, but I think we will assume it for the purpose. Assume that an oil well operator if he can get his market for his dry gas, residue gas, he sells it, if he cannot he continues his oil production with a flare, you see ?

A Yes.

Q Assuming that has been the past history of Turner Valley and assuming there are wells today doing that because of some reason, location or small production and are not on the line ?

A Yes.

Q Assume those things and wells continue to operate whether they can sell their dry gas or not. Now under those conditions would you say the householder should be charged either with

the cost of repressuring that gas that is repressured or should bear any part of the loss of that gas which is wasted. Has he anything to do with it.

A You are saying - taking the second part of your question first Mr. Fenerty. As far as the householder bearing any part of the cost of that gas which is flared I would say no. He is not getting any benefit only through the price of oil.

Q Then let me follow that. If the householder does not pay it and the consumer does not pay it then there is only one place left to pay it and that is the oil industry. Some one has to pay it.

A What cost are you dealing with as I see it Mr. Fenerty ?

MR. McDONALD: You asked him a question and he should be permitted to explain.

MR. FENERTY: I do not want it. It was sufficient for my purposes that the householder does not pay it.

MR. McDONALD: I do not think the witness has any idea of what you are talking about now.

MR. FENERTY: So far as I am concerned the householder does not pay it. If you want me to press that the oil industry should I will go on.

THE CHAIRMAN: The oil industry is not paying any cost of repressuring of any gas that is flared ?

A Yes, that is right.

THE CHAIRMAN: I got that conclusion out of your question myself Mr. Fenerty.

Q MR. FENERTY: You say that the householder should not pay. You did tell me that the householder should not pay the repressuring cost of gas that is repressured ?

A No I said it depends who receives the benefit. If that gas

is repressured for purpose of making it available to the household consumer why then it is conceivable that the household consumer should pay the cost of repressuring as a matter of policy, not speaking of the question of economics.

Q It will depend upon who will receive the benefits ?

A In my opinion. I would say that would go a long way towards determining where the cost should be allocated or not allocated, but cost should be assessed.

Q Now let us take that situation. Take John Smith who is a banker and lives in Elbow Park or on the North Hill and has lived in Calgary for two years and he burns gas for two years. Then he moves to Regina and has somebody else employed by another bank burning coal who lives alongside of him and he moves away in two years and the benefits of repressured gas become available let us say for the sake of argument in ten years time. And that repressured gas is in fact used in ten years time. Would you say that the man that burned gas in his furnace for two years on the North Hill has anything to do with it ?

A Has anything to do with what ?

Q Should pay for any of the cost of repressuring ?

A Well I would assume Mr. Fenerty that the decision as to repressuring or not has been made by present consumers. That is the passing of a conservation law or conservation act and the things of that kind.

Q Let us get this first. After all you will perhaps agree with me that the man who burns coal on the North Hill for two years should not have anything to do with it, and should not pay any part of those costs. It is just outside of the picture, is it not ?

A Yes, that is right.

Q Is there any reason because his associate burns gas for two years that he should pay for it ?

A It can be a reason that he should if he participated in making the decision that he wanted that gas conserved for future generations or the next ten years. He may have expected to receive the benefits. We do have situations where men move around. We all move around but he anticipated a certain benefit.

Q That would be the only reason ?

A And I am assuming now that he agreed to the conservation of that gas and such expenses and costs necessary to conserve the gas and he was willing to accept the cost of doing so.

Q And that would be the only possible basis for charging him with any part of that cost. That he had participated or asked for that himself because he might use that sometime in the future ?

A Either that as an individual or as a majority of consumers as I see it working in a democratic group.

(Go to Page 4007)

Q Mr. Zinder, are you, - has your whole proposal been based on the proposition that this residue gas in Turner Valley is hypothecated to or allocated to industrial, commercial and domestic consumers in the various municipalities in Alberta ?

A As I say I just did not want to interpret the Natural Gas Act but as I understood it - -

Q That is your basis ?

A That is right, that is right.

Q And you have in your report outlined a number of the past, present and expected future uses for natural gas ?

A That is correct.

Q And as a result of some of the developments which have taken place, perhaps on account of the war, would it be fair to say that possibly the burning of natural gas in a coal furnace with natural gas applicances adapted to it, may in a short time be the most uneconomic use there could be for that natural gas ?

A Oh I would not think so. I do not know. If I understand your question, you say with the burning of natural gas in a coal furnace with the coal furnace changed to the use of natural gas may in the future be very uneconomic ?

Q Yes.

A Well whether it be uneconomic or not will depend upon the relative prices of coal and gas at that time. I am anticipating that there is a definite trend towards increasing the value of natural gas. I hope I did not imply that that value might go up so high as to make it completely uneconomic under almost any circumstances as a fuel. I say it has increased in value and it is my opinion it will continue to increase in value.

Q Will you go this far, that as a result of scientific developments, the burning of natural gas for fuel might amount to an economic waste ?

A Well I have not considered that as a possibility.

Q You have not ?

A No.

Q I see.

A And when you say the burning of natural gas as a fuel, burning it whether as a fuel, you mean it is burned as a fuel in domestic furnaces. It may be burned as a fuel for a public utility for generating electricity say, or in any number of other ways but generally speaking I would say my answer is as I have given it.

Q But I was wondering whether in the progress in the use of natural gas, particularly in manufactured gasoline and high test gasoline, whether that may have progressed to the point where it would amount to an economic waste to use it for just plain fuel under any conditions ?

A Well so far as, Mr. Fenerty, in the reading and studying which I have done, the opinion is that a substantial amount of gas would be required for these various chemical processes and uses but not nearly enough to, I will say, take up the equivalent of the present production by a long way.

Q But at all events they have gone this far that there may be a grave question in the future whether, with all these other methods of utilizing this dry gas, whether it would be available at prices which would compare with other fuels ?

A Well if you want my opinion I would say, if that time would come it would be certainly far in the future.

Q I see.

A And I have not visualized it.

Q I see.

A And I might add of course there are off-setting factors. Other factors which work as well.

Q I see. Righto. Now in speaking of the problem which confronts us Mr. Zinder, you referred to, at the top of Page 3, you referred to this situation which existed as the result of oil exploration or oil burning in the result of gas being flared and then you say:

> "It can be corrected either by regulation governing production and conservation, or by price regulation, or both . In the United States the principal, if not the only, means adopted for the correction of such situations, is conservation regulations and not price control. In the present instance, the problem is one of fixing price."

Do I understand you to mean by that, that you control this situation involving the flaring of gas by the regulation of the price, - that is what that seems to mean to me, instead of by merely the control of, by conservation regulations.

A I would say what I had in mind there, Mr. Fenerty, was that, given a higher price for gas in the field - -

Q Yes.

A Much of the flaring which has been going on in the past or maybe going on now will be stopped and that gas goes to market; assuming now that the increasing market demand or markets are available. I have several instances in mind, one being the situation which I mentioned on Page 3 about the five cent gas in the Gulf-coast region. I know that in the Gulf-coast region considerable gas in the past has been flared but when the pipe line companies have offered four and five cents for

that gas to take it to market, why it found a market.

Q I see. Now I am going to suggest to you, you have the situation in reverse, and that the price fixing or the price, in the sense of a fair price, is going to aggravate the Turner Valley situation. Now I want you to follow me in this as far as you will ?

A I will.

Q And that is, with a higher price the less gas you will sell without new markets. I do not say the less money you will get but the less gas you will sell, that is right is it not ?

A Does not that require a number of assumptions ?

Q I will come to that, but generally speaking the higher the price the less you sell of a product, that is right is it not ?

A Well if the market will absorb that gas at that price it may not be, at the higher price.

Q Yes, all right, but assume for a moment that with the increase in price you lose some of your markets, you just assume that.

A All right.

Q The result is you have more gas to flare or compress, have you not if it is to continue ?

A Or repressure.

Q Repressure, I should have said instead of compress ?

A That is right.

Q And the more gas you have to repressure the more it costs you to do it, that is just an ordinary thing ?

A That is right, and you have a further assumption I expect that you have no new markets.

Q Yes, if you assume that you have a smaller market, you have a smaller market and then you have an increased operating cost, do you not ?

A If you assume there is no other market you have a smaller market and - -

Q And an increased operating cost ?

A An increased unit operating cost.

Q And more repressuring in the cost ?

A That is right.

Q And that kind of thing only leads to one place, does it not ?

A I do not understand your question.

Q If you reduce your market and you increase your cost, you come to the end of the rope some time, do you not, with that constantly recurring ?

A Now I have stated that in the converse, Mr. Fenerty, that by reducing prices you might increase profits, that is you might get a greater volume of sales and have enough margin to take care of these increased costs.

Q And has it occurred to you that that may be our problem here ?

A It has.

Q To decrease prices and increase markets, just that ?

A That may be.

Q THE CHAIRMAN: To Mr. Fenerty's general question, that is if you increase the price you may have less markets, you said "that there are certain assumptions that you would have to make", now I would like to hear those assumptions which you would make before you would accept that proposition so that we will have it all in the one place in the record.

A Yes. Well what I was thinking of was that perhaps Mr. Fenerty's question was in general, not specific, as to what the situation might be here. Of course if you have an increased cost of the price of the gas in the field, whether you will have to increase the price to the ultimate consumer I do not know.

There are too many other factors, there is the cost of gathering, the cost of compressing, the cost of transporting and the cost of distribution. That was really what I had in mind, Mr. Chairman.

Q Had you in mind the possibility that the John Jones that Mr. Fenerty spoke of might prefer to pay five cents more for his gas than to burn coal ?

A That is correct. I had that and also the fact that, I might add the fact that that is assuming that the price of competing fuels are stable and they might be going up, so there are many factors which might be involved.

THE CHAIRMAN: I just wanted to get all this at the one point.

MR. FENERTY: Yes, certainly, sir.

Q MR. FENERTY: Now you did outline some of the benefits of a low price natural gas; at the moment I have finished discussing the disadvantage of a higher price and I want to talk of the benefits of the low price and at the middle of Page 3 you say:

"A low price for natural gas or oil will build up an export demand '

and this is the part I am interested in:

'or bring industry from the United States to Canada".

Now that would also perhaps apply to industries from other parts of Canada, perhaps to Alberta, might it not ?

A That might apply also, yes.

Q Yes, and you have heard that some people in this part of the world think we are suffering from certain disadvantages in the middle west on account of freight rates and other matters of that kind ?

A Yes.

Q You have probably heard those sort of things ?

A Yes.

Q And that in eastern Canada, as perhaps in the eastern States, there are certain advantages to manufacturing industries, such as lower freight rates and contralization and so on, as compared with the west ?

A I do not know it as a fact, but if you ask me to assume it, all right, go ahead.

Q And I want you for a moment to look at this natural gas, this dry gas, as a by-product of the oil and natural gasoline industry. I think you have been disposed to look at the oil and gasoline as a by-product of the natural gas field, have you not, here ?

A I would say "no", Mr. Fenerty. You have the entire range of the situations, you start off with a gas well, you call it a gas well although a certain amount of oil is produced and then you go all the way down probably in your wells, relative operations of oil and gas until you find that gas is only a minor and the most of the production is oil, so you have the whole range, although you have your gas cap wells, as I understand, where you have your dry gas and then you have the gas got from the oil wells, where it is a joint product.

(Go to Page 4014)

Q I am afraid I got down a side alley there for a moment; just getting back to this situation, I am going to suggest to you that the proper approach to this problem is to seek to make use of the advantages which we have in natural gas to obtain the wider market which involves rates which will encourage industry, or those attendant circumstances to a cheaper rate, what do you say to that approach to the problem, as the way to handle natural gas as a natural resource?

A Let me see if I understand you correctly, what you are suggesting, Mr. Fenerty, is that the problem should be one of cheap or low natural gas rates in order to encourage industry and in order to develope the market?

Q Yes?

A Yes, I would agree with that.

Q Yes. Now I am just going to ask you to go through a little cycle with me as to why I think that is the problem. I am going to invite you to assume, and you have to assume this now because we have no evidence of it, that there are at the present time in this area in Alberta fuels which are competitive with gas - we will start with that in the case of large manufacturing industries, and now just for the moment assume that is so, - I know there has been a brief filed here that says it is not so, but assume for the moment that it is so, and assuming no matter what price increase there is in natural gas, the householder will continue to burn it because of its convenience and cleanliness and so forth, - now I want you to assume those things, and now I suggest to you that if there are competitive fuels such as we will say stoker coal for instance, if that should be competitive now, any increase in the price of natural gas will result in the loss of the large manufacturing consumers

or some of them, because it is a matter of dollars and cents to them?

A That is right.

Q And then I suggest to you that you have installations in connection with this gas field which must be paid for, youhave got the amortization charges, youhave interest, you have wages, you have got many fixed charges which will go on, and with an increase in price you get the large manufacturers off the line, and I take it it is obvious you do not get new ones in place of them because of your increased price, then you are going to have a smaller amount of money to pay those charges, aren't you?

A From the remaining consumers?

Q Yes?

A Yes.

Q And that, in turn, necessitates another increase in price, does it not?

A Not another increase in price, but an increase in price to the remaining consumers.

Q To the remaining consumers?

A Assuming now that the profits at the time you start are reasonable?

Q Yes? That necessitates another increase to take care of all those charges, to the consumer?

A That is right.

Q And that means we will say that many of the large manufacturers and some of the commercials go off the line, that is what inevitably happens?

A That is assuming now that the price increase is to be such that it is beyond that competitive level.

Q Assuming you have the fuel today that is in no way at all competitive with existing prices in any branch where gas is burned,.....

A I think you might have to add one other factor which the Chairman has mentioned, which certainly is a factor in the domestic use of gas, and I think even also to a certain extent and in some cases to a very considerable extent, to where commercial gas is being used, and that is the B.T.U. basis.

(Go to page 4017).

Q But it will keep going off the line starting, first, with the big manufacturers and then with the smaller manufacturers, and them some commercials wherever they are situated, where they have a janitor employed and so on?

A Yes.

Q And in apartments blocks where one janitor can handle the work?

A Yes.

Q And then some more go off the line and then there is an increase and you get to the position that all of the manufacturers and commercials go off the line leaving the householder. That is what you have got, haven't you?

A Under your series of assumptions I will say yes, Mr. Fenerty.

Q Yes. And have you made any analysis at all or given any thought to the problem there would be if the householders have to pay for these gas operations in Turner Valley?

A Mr. Fenerty, the same type of reasoning has occurred to me.

Q Yes?

A However, one can make certain assumptions.

Q Yes?

A But one cannot tell how far they are from the facts. I do not know what the facts are here, as to what the relationship is between the price of gas to start with and the returns which they have earned or have been earned by the Gas Company, or the various positions, or rather the relationship or the relative position of the various prices to the margin of profit on the various classes of sales. In fact, I would have to know for my own reasoning before I would come to any conclusion.

Q I appreciate that, that if my premises are unsound, my conclusions fall flat, but all I am asking you is to assume here that if

my premises are sound that my conclusions are correct, that is all I am asking you?

A Taking it on that basis, and on the assumption that they are sound, that follows.

Q If my assumptions are sound, that follows?

A I cannot say whether your premises are sound.

Q I did not ask you to?

A All right.

Q That rests with me, if I can make that come out. And then you come to a time where the householder cannot carry it, no matter what his desires are, don't you?

A You are going to the price increase above the competitive level and for the convenience factor value, leaving only the domestic?

Q Yes?

A Yes.

Q And assuming he has gas from other sources, he wouldn't even try to carry it, would he?

A If he had gas from other sources at a price as low or a lower price, then I would say that he would not try to carry it.

Q And it follows from that, does it not, that if you have a competitive fuel in any branch now burning gas, that an increase in the price of gas is out, isn't that the result of it all?

A If you have a competitive fuel?

Q In any branch burning gas?

A In any branch burning gas?

Q In any industry or any properties burning gas, any class burning gas?

A If it is competitive to the extent of being equal on a fuel basis plus offsetting any additional value of the gas due to its convenience, cleanliness, no ash, no storage, and factors of that kind, then any increase of course would drop that

market.

Q Let me get that now. Aren't you going into something that is not in the picture? You have agreed with me, have you not, that when you get to the large manufacturer it is going to be a matter of dollars and cents, you see. We have agreed on that, haven't we?

A Yes.

Q And I am suggesting to you that by a gradual process to get to the place that even if the householders have got to have dust and ashes and everything else, they cannot carry Turner Valley, he cannot just continue to burn gas. Doesn't it follow that when you get to that place the convenience and everything else is not an element?

A On the assumptions that the consumer cannot pay for the gas, no matter what, of course he is not going to. That is all, I take it, you are saying, Mr.Fenerty?

Q Yes?

A If the cost gets to a point where he cannot afford to buy it, naturally he is not going to have it.

Q Now, Mr.Zinder, have you made an investigation as to the reasons for the present set-up in Turner Valley, the location of the wells, the location of the compressing stations and the scrubbing plants and all the elements going to make up the present set-up?

A I have not.

Q And did you arrive at the present conclusion that the present location of the wells was dictated by a search for oil rather than gas?

A I could not answer that based upon any investigation I made. I would not be surprised to find, I think it is probably

true that, like most places, one digs for oil and tries to find oil first, so that those considerations may have had some influence. I do not know.

Q And if that picture as to costs, efficiency, in other words is unfavourable from a point of view of the dry gas industry as compared to what it would have been if it had been developed as a dry gas industry, would you expect to charge the consumer of the dry gas with those costs, a portion of those added costs? I am just speaking generally now.

A You say, Mr. Fenerty, if the costs situation with respect to the dry gas wells is unfavourable, would I expect them to charge those costs, is that the question?

Q I am not expressing it very well. Let us assume for the moment that you have a development as an oil industry at great expense, do you see?

A Yes.

Q And as a result of that particular kind of development, there have been returns in production of oil and perhaps natural gas greatly exceeding the total cost, and incidental thereto a large part of the gas in the field has been wasted, you see, or flared. If you had that kind of a picture is it right, that far, to approach the problem of the proper price to be paid for gas on the basis of the residue of gas available, the amount of oil obtained now and the other elements, and with regard to the past history of that field?

A Well, as I stated in my - I think I answered your question, Mr. Fenerty, in my direct statement.

Q Yes?

A What I tried to say there was that if you took the position that you are asking me to take that in effect is saying

that a particular oil well or the oil companies have made enough money?

Q Yes?

A Now, what measures go into that? The fact that their investment may have been returned in 5 years of 1 year, or 10 years is not necessarily an index as to how much money they made or could not have made. There are operating expenses to be deducted from those figures of course. So that, to start with, you are then saying as to what is a reasonable profit that the oil company ought to make. You have to say that somewhere. You say that they have made enough to begin with, and then you have made a conclusion, and therefore they ought to give the gas away.

Q I am trying to get a little deeper than that, or perhaps shallower, I am not sure which.

A Maybe I am not following you.

Q I am trying to envisage a situation where, as the result of an expensive oil installation, to simplify the matter, a large amount of money has been made and in making that large amount of money a large amount of gas has been wasted, you see?

A Yes.

Q Which normally would make the remaining gas more expensive wouldn't it?

A Yes.

Q If you have a smaller field for the same operation you have got to charge so much more per unit?

A Yes.

Q I am interested in your approach to the 60 wells. True, those are gas wells, you say, but take them as an idea generally for the whole field, I am going to suggest to you that you could only give consideration to those figures that you have

there on the same basis that the same ratio that prevailed in the past with reference to production of oil and gas in prices. Am I being too obscure here?

A I am trying to follow you.

Q You see, what I am trying to suggest again is that you are taking a field where the oil industry has used the gas, we will say, to make a profit or return the cost or investment. Assuming that has happened, do you see?

A Yes.

Q And they are able to return the cost of investment of an expensive installation which would not correspond with what would have been done if it had been the gas industry? Will you go that far with me?

A I am afraid I am getting lost.

Q Well, perhaps I am wrong. I will just add one more. Look, you have got an oil development?

A Yes.

Q Which costs more than the gas development?

A Yes.

Q In the same area, assume that?

A Yes.

Q And as the result of the oil development there has been a lot of money made, do you see?

A Yes.

Q Should the gas industry pay for that increased cost of development when it does not participate in the profit that came from it, that is what I want to know?

A Well what the gas industry should or should not say with respect to the price of gas, the approach I am taking here is, that the gas has a certain value at the well. Whatever that pays for it will pay for, you see. It is unreasonable

to state whatever costs or wherever the costs are, that is, the price being set above that value, so that I say from a cost point of view, as I have recommended and stated in my direct submission, I am not recommending that you aproach the problem from a cost basis.

Q Yes, I understand that. But you appreciate that now, suppose somebody else here thought for a moment that you have approached it from that problem, the one way you could approach it is, is it not, if the gas industry is going to be a part of the increased costs, then it should get some of the benefits from it, shouldn't it?

A Well, the answer to your question, Mr. Fenerty, if the gas consumers are going to bear some of the increased costs of the oil development, they should get some of the benefits of it. I do not know that that is a question, I might say, of equity or policy. I approach the question of costs as a question of determining how costs behave. Here are two products being produced from the well. What are their costs? Now, after you determine costs, you have one further step, and that is determining the price. Now, in a question of determining price, you may bring in questions of policy or equity or something of that kind, to approach it technically from the side, or approach it scientifically, what are costs, I am not looking beyond how those costs behave, and what product is responsible for that, not how it will be on the other side.

Q Perhaps I can clear it up in one question?

A Yes.

Q As far as you are concerned, while you did work out that problem on the basis of 60 wells, you did not recommend

that approach.

A I have not recommended the cost approach.

Q And you do not know?

A I do not know.

Q And would you go so far as to say with me with your knowledge of the situation that has preceded the present one, and as we are now, that it is a completely unsound approach?

A I think the costs appraach, the question of the price, or costs of the gas at the well, is an unsound approach.

Q Thank you. Then I do not need to ask you anything more on that now.

THE CHAIRMAN: We will adjourn now.

(The Hearing was then adjourned to be resumed November 13th, 1945, at 9.30 A.M.)